

## CLAIMS

I/We claim:

1. A system for controlling a permanent magnet machine, the system comprising:

a plurality of phases located within the permanent magnet machine, each phase having a plurality of machine coils, the machine coils being spatially distributed about the motor;

a plurality of switch circuits in electrically parallel connection, each switch circuit having a first power switch in electrical series connection with a second power switch; and

wherein each switch circuit is in electrical communication with a machine coil of the plurality of machine coils.

2. The system according to claim 1, wherein each switch circuit is electrically connected with the machine coil between the first and second power switch.

3. The system according to claim 1, wherein the first and second power switches are MOSFETs.

4. The system according to claim 3, wherein the first and second power switches are N-channel MOSFETs.

5. The system according to claim 3, wherein a drain of the first power switch is connected to a source of the second power switch.

6. The system according to claim 5, further comprising a power source wherein a first side of the power source is connected to a source of the first power switch and a second side of the power source is connected to a drain of the second power switch.

7. The system according to claim 5, wherein each switch circuit includes a capacitor in electrically parallel connection with the first and second power switch.

8. The system according to claim 7, wherein the capacitor electrically connected between a source of the first power switch and a drain of the second power switch.

9. The system according to claim 8, wherein the capacitor is mounted in close proximity to the first and second power switch and configured for DC line filtering and snubbing of the switch off transients.

10. A system for controlling a permanent magnet machine, the system comprising:

a plurality of phases located within the permanent magnet machine, each phase having a plurality of machine coils, the machine coils being spatially distributed about the motor;

a plurality of switch circuits in electrically parallel connection, each switch circuit having a first power switch in electrical series connection with a second power switch, wherein each switch circuit is electrically connected to one of the plurality of machine coils between the first and second power switch.

11. The system according to claim 10, wherein the first and second power switches are MOSFETs.

12. The system according to claim 11, wherein the first and second power switches are N-channel MOSFETs.

13. The system according to claim 11, wherein a drain of the first power switch is connected to a source of the second power switch.

14. The system according to claim 13, further comprising a power source wherein a first side of the power source is connected to a source of the first power switch and a second side of the power source is connected to a drain of the second power switch.

15. The system according to claim 13, wherein each switch circuit includes a capacitor in electrically parallel connection with the first and second power switch.

16. The system according to claim 15, wherein the capacitor electrically connected between a source of the first power switch and a drain of the second power switch.

17. The system according to claim 16, wherein the capacitor is mounted in close proximity to the first and second power switch and configured for DC line filtering and snubbing of the switch off transients.